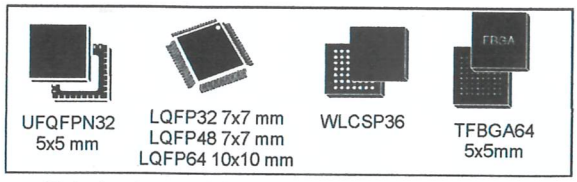
STM32L051x6 STM32L051x8

Access line ultra-low-power 32-bit MCU ARM®-based Cortex®-M0+, up to 64 KB Flash, 8 KB SRAM, 2 KB EEPROM, ADC

Datasheet - production data

Features

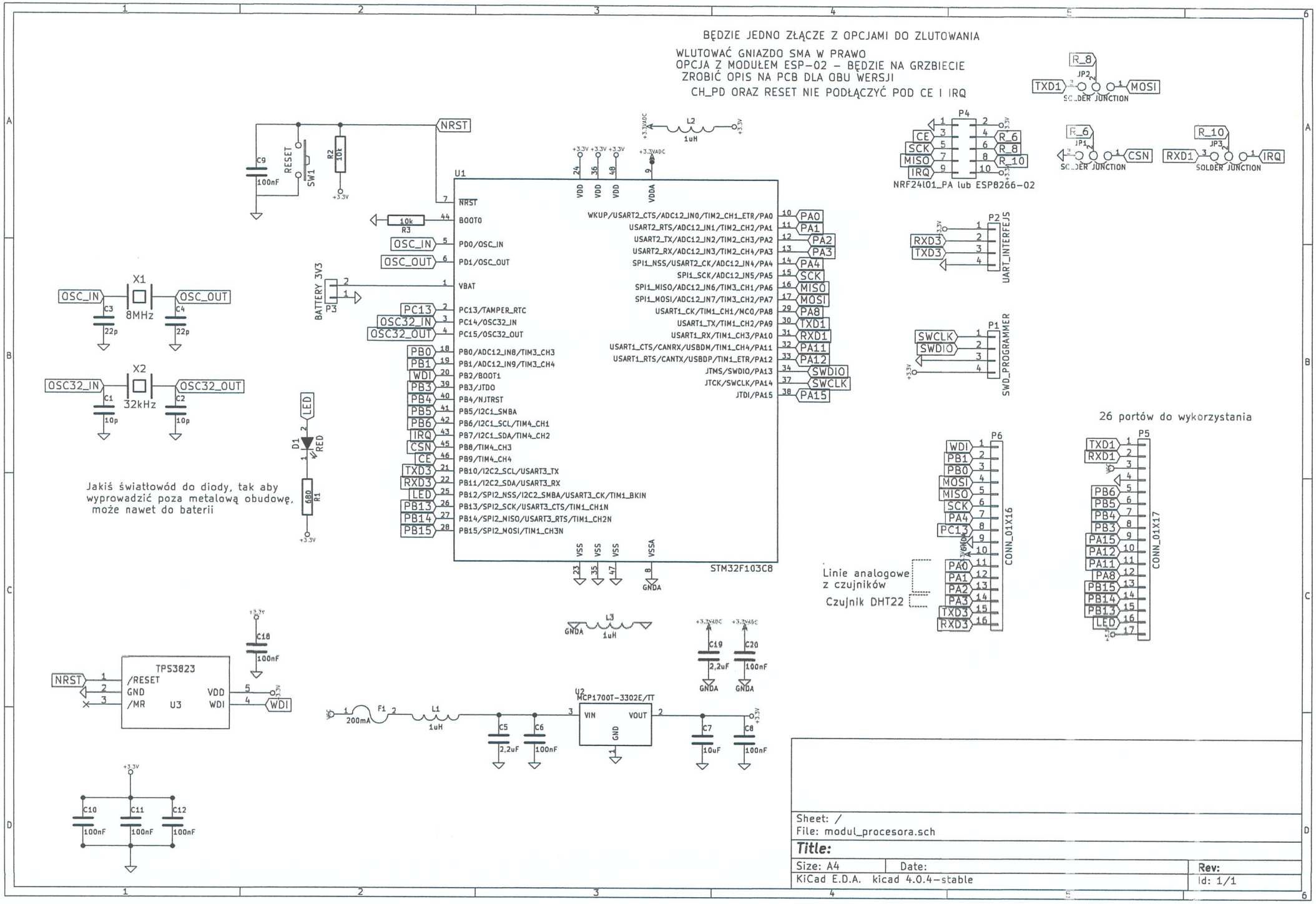
- Ultra-low-power platform
  - 1.65 V to 3.6 V power supply
  - -40 to 125 °C temperature range
  - 0.27 µA Standby mode (2 wakeup pins)
  - 0.4 µA Stop mode (16 wakeup lines)
  - 0.8 µA Stop mode + RTC + 8 KB RAM retention
  - 139 µA/MHz Run mode at 32 MHz
  - 3.5 µs wakeup time (from RAM)
  - 5 µs wakeup time (from Flash)
- Core: ARM® 32-bit Cortex®-M0+ with MPU
  - From 32 kHz up to 32 MHz max.
  - 0.95 DMIPS/MHz
- Reset and supply management
  - Ultra-safe, low-power BOR (brownout reset) with 5 selectable thresholds
  - Ultralow power POR/PDR
  - Programmable voltage detector (PVD)
- Clock sources
  - 1 to 25 MHz crystal oscillator
  - 32 kHz oscillator for RTC with calibration
  - High speed internal 16 MHz factory-trimmed RC (+/- 1%)
  - Internal low-power 37 kHz RC
  - Internal multispeed low-power 65 kHz to 4.2 MHz RC
  - PLL for CPU clock
- Pre-programmed bootloader
  - USART, SPI supported
- Development support
  - Serial wire debug supported
- Up to 51 fast I/Os (45 I/Os 5V tolerant)
- Memories
  - Up to 64 KB Flash with ECC
  - 8KB RAM
  - 2 KB of data EEPROM with ECC
  - 20-byte backup register
  - Sector protection against R/W operation



- Rich Analog peripherals
  - 12-bit ADC 1.14 Msps up to 16 channels (down to 1.65 V)
  - 2x ultra-low-power comparators (window mode and wake up capability, down to 1.8 V)
- 7-channel DMA controller, supporting ADC, SPI, I2C, USART, Timers
- 7x peripherals communication interface
- 2x USART (ISO 7816, IrDA), 1x UART (low power)
- 2x SPI 16 Mbits/s
- 2x I2C (SMBus/PMBus)
- 9x timers: 1x 16-bit with up to 4 channels, 2x 16-bit with up to 2 channels, 1x 16-bit ultra-low-power timer, 1x SysTick, 1x RTC, 1x 16-bit basic, and 2x watchdogs (independent/window)
- CRC calculation unit, 96-bit unique ID
- All packages are ECOPACK®2

Table 1. Device summary

Reference	Part number
STM32L051x6	STM32L051C6 STM32L051K6 STM32L051R6 STM32L051T6
STM32L051x8	STM32L051C8 STM32L051K8 STM32L051R8 STM32L051T8


BĘDZIE JEDNO ZŁĄCZE Z OPCJAMI DO ZLUTOWANIA
WLUTOWAĆ GNIAZDO SMA W PRAWO
OPCJA Z MODUŁEM ESP-02 – BĘDZIE NA GRZBIECIE
ZROBIĆ OPIS NA PCB DLA OBU WERSJI
CH_PD ORAZ RESET NIE PODŁĄCZYĆ POD CE I IRQ
NRF24l01_PA lub ESP8266-02
SOLDER JUNCTION
UART_INTERFEJS
SWD_PROGRAMMER
26 portów do wykorzystania
STM32F103C8
TPS3823
MCP1700T-3302E/TT
Jakiś światłowód do diody, tak aby wyprowadzić poza metalową obudowę, może nawet do baterii
Linie analogowe z czujników
Czujnik DHT22
CONN_01X16
CONN_01X17
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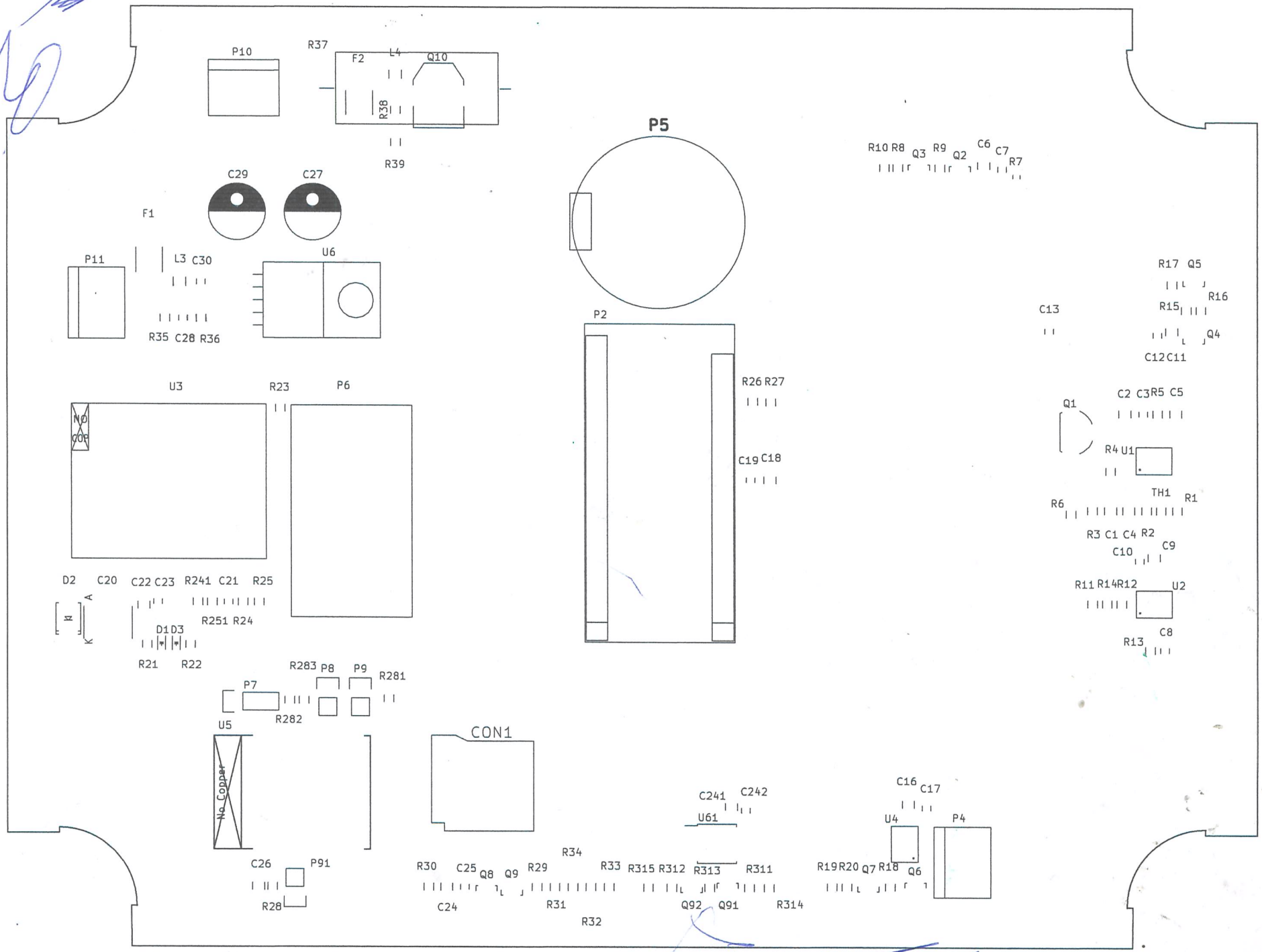
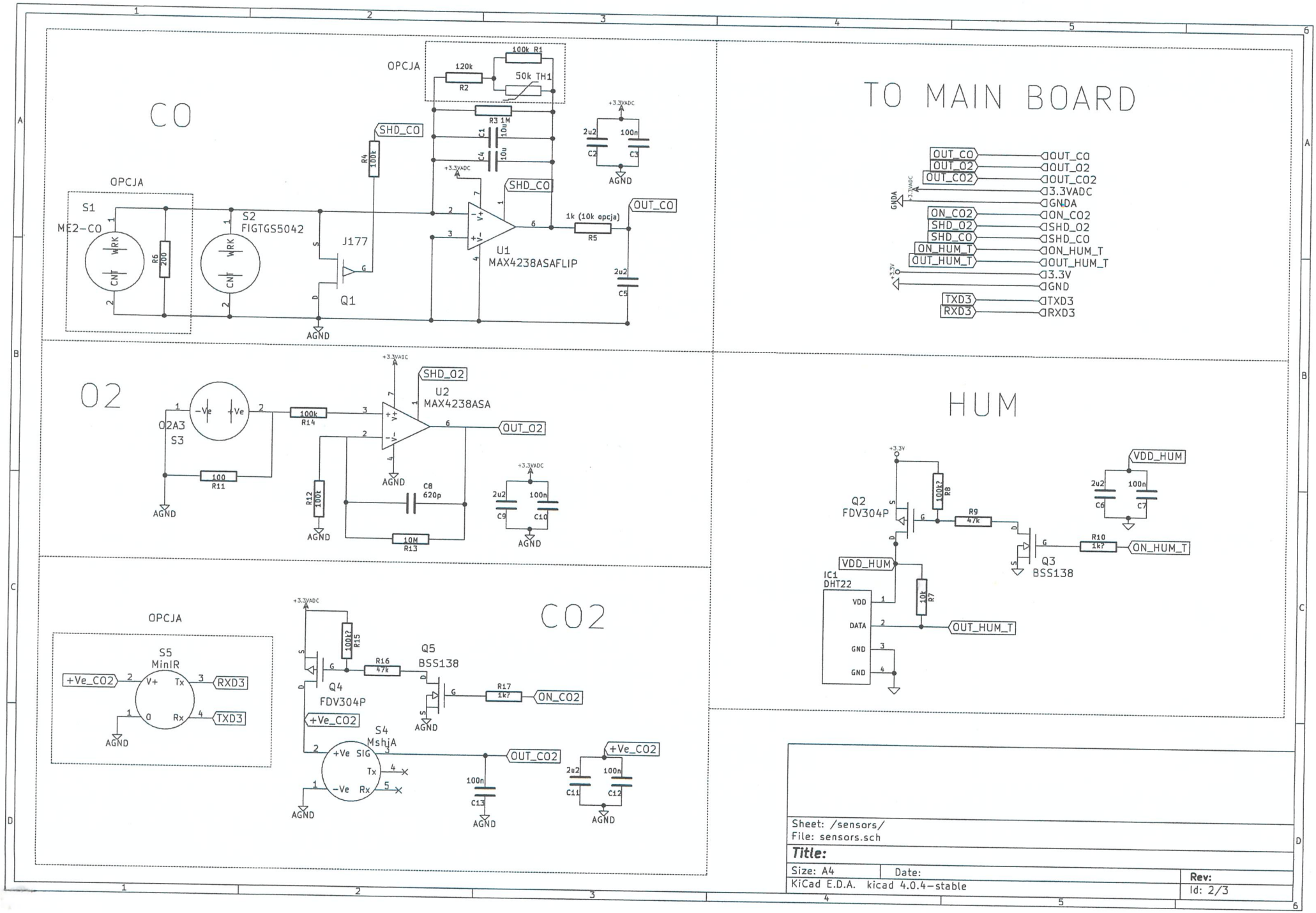
File: modul_procesora.sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad 4.0.4-stable
Id: 1/1


P10
R37
F2
L4
Q10
R38
R39
P5
R10 R8 Q3 R9 Q2 C6 C7 R7
C29
C27
F1
P11
L3 C30
U6
R35 C28 R36
P2
R17 Q5
R16
R15
C13
Q4
C12 C11
R26 R27
C19 C18
C2 C3 R5 C5
Q1
R4 U1
TH1
R1
R6
R3 C1 C4 R2
C9
C10
U3
R23
P6
NO COPPER
D2
C20
C22 C23 R241 C21
R25
R251 R24
D1 D3
R21
R22
R11 R14 R12
U2
C8
R13
R283
P8
P9
R281
P7
R282
U5
No Copper
CON1
C241
C242
U61
C16
C17
U4
P4
C26
P91
R28
R30
C25
Q8
Q9
R29
R34
R33
R315
R312
R313
R311
R19 R20 Q7 R18 Q6
C24
R31
R32
Q92
Q91
R314



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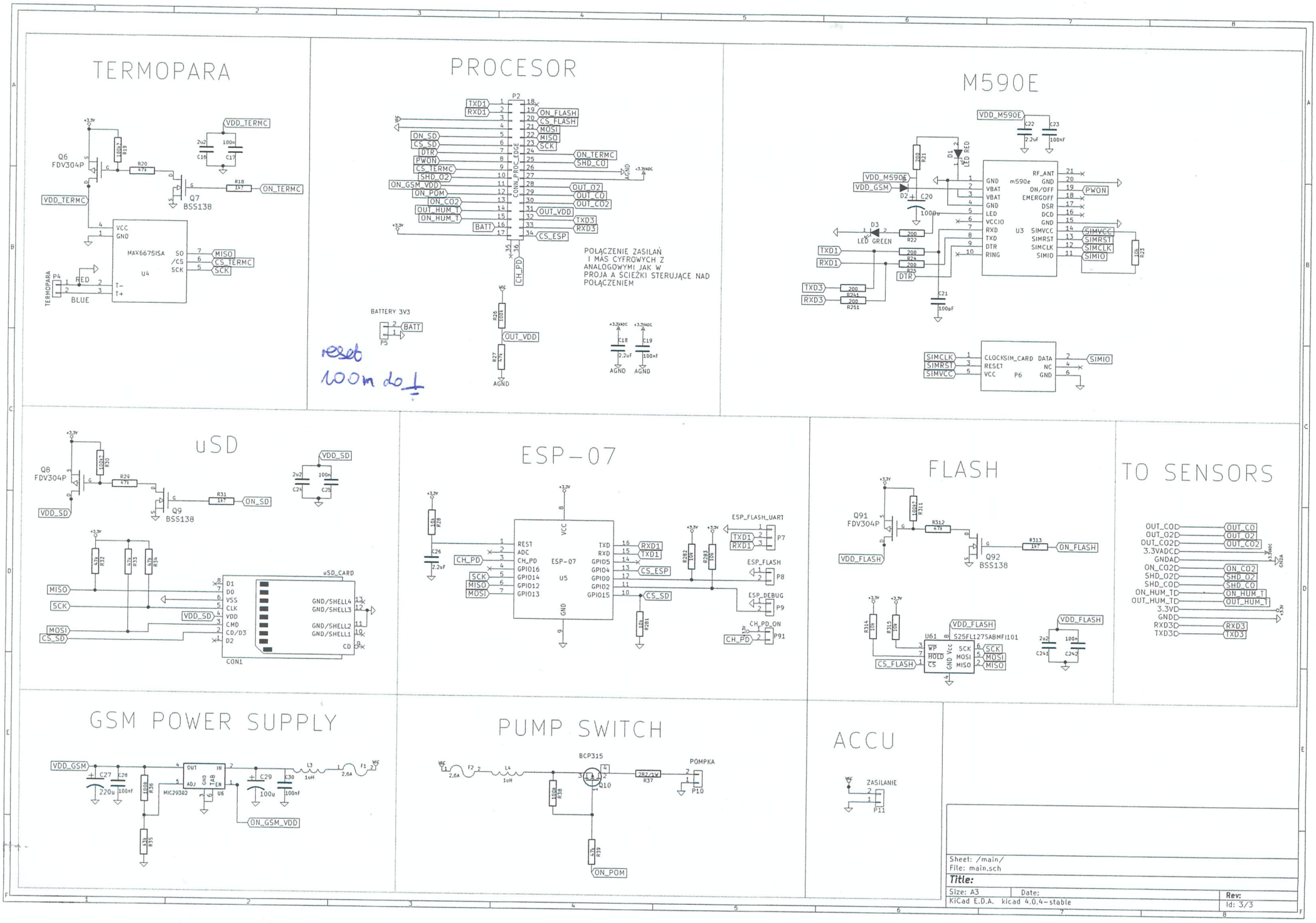
Size: A4	Date:
KiCad E.D.A. kicad 4.0.4-stable	Rev:
	Id: 2/3


TERMOPARA
PROCESOR
M590E
uSD
ESP-07
FLASH
TO SENSORS
GSM POWER SUPPLY
PUMP SWITCH
ACCU
POŁĄCZENIE ZASILAŃ
I MAS CYFROWYCH Z
ANALOGOWYMI JAK W
PROJA A ŚCIEŻKI STERUJĄCE NAD
POŁĄCZENIEM
reset
100n do ⊥
Sheet: /main/
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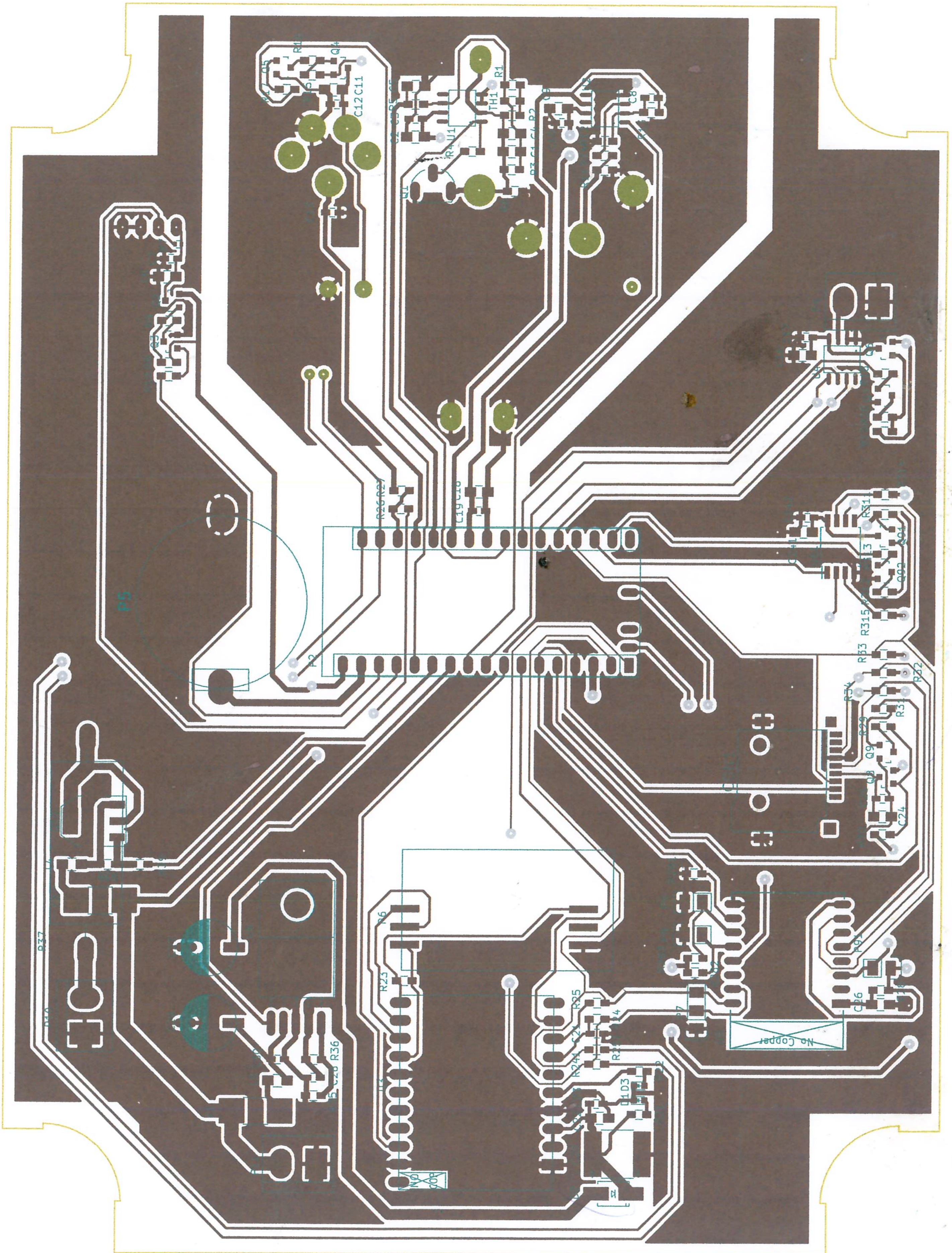
Size: A3
Date:
Rev:
KiCad E.D.A. kicad 4.0.4-stable
Id: 3/3



Oznaczenie	Obudowa	Ilo≈õƒá	Oznaczenie
S4	MSHia-P-CO2	1	MshiA
U6	TO-220_5_Horizontal_SMDOTW	1	MIC29302
IC1	DHT22_VERT	1	DHT22
U5	ESP-07v2_SMD	1	ESP-07
R282,R23,R28,R281, R283,R314,R315	R_0603_HandSoldering	7	10k
P7	Pin_Header_Straight_1x03_SMD	1	ESP_FLASH_UART
S3	O2-A3	1	O2A3
R13	R_0603_HandSoldering	1	10M
S2	TGS5042-A00	1	FIGTGS5042
P2	MODUL_PROC_PINS_17_16_EDGE	1	CONN_PROC_EDGE
U3	m590e	1	m590e
C1,C4	C_0805_HandSoldering	2	10u
C2,C5,C6,C9, C11,C16,C24,C241	C_0805_HandSoldering	8	2u2
C3,C7,C10,C12, C13,C17,C25,C242	C_0603_HandSoldering	8	100n
C8	C_0603_HandSoldering	1	620p
C18,C22,C26	C_0805_HandSoldering	3	2,2uF
C19,C23,C28,C30	C_0603_HandSoldering	4	100nF
C20	C_2225_HandSoldering	1	1000u
C21	C_0603_HandSoldering	1	100pF
D1	LED_0603	1	LED RED
D2	SMA_Handsoldering	1	D
D3	LED_0603	1	LED GREEN
F1,F2	R_1812_HandSoldering	2	2,6A
L3,L4	R_0805_HandSoldering	2	1uH
P4	ZACISK_2_PIN_SMD	1	TERMOPARA
P5	CR2032_SMD	1	BATTERY 3V3
P6	SIM_CARD	1	SIM_CARD
P8	Pin_Header_Straight_1x02_SMD	1	ESP_FLASH
P9	Pin_Header_Straight_1x02_SMD	1	ESP_DEBUG
P10	ZACISK_2_PIN_SMD	1	POMPKA
P11	ZACISK_2_PIN_SMD	1	ZASILANIE
Q1	TO-92-FET-molded-wide-DGS_SMD	1	J177
Q2,Q4,Q6,Q8,Q91	SOT-23_GSD	5	FDV304P
Q3,Q5,Q7,Q9,Q92	SOT-23_GSD	5	BSS138
Q10	SOT-223	1	BCP315
R1,R4,R12,R14, R26,R36,R38	R_0603_HandSoldering	7	~~100k~~
R2	R_0603_HandSoldering	1	120k
R3	R_0603_HandSoldering	1	1M
R5	R_0603_HandSoldering	1	1k (10k opcja)
R6,R21,R22,R24,R25, R241,R251	R_0603_HandSoldering	7	~~200~~
R7	R_0402	1	10k
R8,R15,R19,R30,R311	R_0603_HandSoldering	5	100k?
R9,R16,R20,R27,R29, R32,R33,R34,R39,R312	R_0603_HandSoldering	10	47k
R10,R17,R18,R31,R313	R_0603_HandSoldering	5	1k?
R11	R_0603_HandSoldering	1	100
R35	R_0603_HandSoldering	1	43k
S1	ME2-CO	1	ME2-CO

S5	MINIR	1	MinIR
TH1	R_0603_HandSoldering	1	50k
C27	C_Radial_D8_L11.5_P3.5_SMD	1	220u
C29	C_Radial_D8_L11.5_P3.5_SMD	1	100u
U1	SO-8	1	MAX4238ASAFLIP
U2	SO-8	1	MAX4238ASA
U4	SO-8	1	MAX6675ISA
R37	Resistor_Horizontal_RM30mm	1	2R2/1W
CON1	uSD_CARD_SMDPOZ	1	uSD_CARD
P91	Pin_Header_Straight_1x02_SMD	1	CH_PD_ON
U61	SOIJ-8_5.3x5.3mm_Pitch1.27mm	1	S25FL127SABMFI101

modul_procesora

Id	Oznaczenie	Obudowa	Ilość	Oznaczenie
1	P3	CR1225	1	BATTERY 3V3
2	P4	Pin_Header_Straight_2x05	1	NRF24l01_PA lub ESP8266-02
3	JP1,JP2,JP3	SMD-SOLDER_JUNCTION_0805	3	SOLDER JUNCTION
4	U1	LQFP-48_7x7mm_Pitch0.5mm	1	STM32F103C8
5	X1	SMD-5x3.2	1	8MHz
6	U2	SOT-23	1	MCP1700T-3302E/TT
7	C1,C2	C_0402	2	10p
8	C3,C4	C_0402	2	22p
9	D1	LED-0603	1	RED
10	F1	SMD-1812	1	200mA
11	L1,L2,L3	SMD-0805	3	1uH
12	R2,R3	SMD-0402_r	2	10k
13	U3	SOT-23-5	1	TPS3823
14	SW1	TACT_SWITCH_6x2.5mm	1	RESET
15	X2	SMD-0805	1	32kHz
16	C5	SMD-0805	1	2,2uF
17	C6,C8,C9,C10,C11,C12,C18	SMD-0603_c	7	100nF
18	C7	SMD-0805	1	10uF
19	R1	SMD-0603_r	1	680
20	P1	Pin_Header_Surface_1x4	1	SWD_PROGRAMMER
21	P2	Pin_Header_Surface_1x4	1	UART_INTERFEJS
22	C19	C_0402	1	2,2uF
23	C20	C_0402	1	100nF
24	P6	Pin_Header_Straight_1x16	1	CONN_01X16
25	P5	Pin_Header_Straight_1x17	1	CONN_01X17